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## Introduction

The term location-based application refers to the ways in which information can be gathered about the geographical position of a communication device such as a smart phone or tablet. This chapter will indicate that the increasing ubiquity of location-based applications is creating a situation in which the technological mediation of everyday life is pervasive and persistent. Therefore it is important to gain insight into how location-based applications intersect social relations, spatial encounters and the practices of everyday life. Following the analytical schema presented by Leah Lievrouw and Sonia Livingstone (2005) this chapter will examine artefacts, (smart phones or tablets), activities (the social and cultural practices that are associated with those devices) and the social arrangements that surround location-based applications.

To weave together various strands of the arguments surrounding the technological mediation of spatial experience through the use of location-based applications, the chapter will explore three key themes: place, play and privacy. Firstly the chapter investigates the ways in which location-based applications map the geographical terrain according to lifestyle and consumption categories. Secondly, the chapter indicates that through the use of location-based applications the urban environment becomes intertwined with computer-game play. Thirdly, the chapter identifies the ways in which location-based applications can be used to collect and mine personal data. In this regard location-based applications raise a series of concerns about privacy, monitoring and surveillance. By taking this three-fold approach, the chapter critically analyses the ideological dimensions to these applications. In doing so, the chapter contends that the ludic aspects of location-based applications are offset by the ways in which they commercialise urban experiences and are implicated in surveillance and data mining.

The analysis of location-based applications involves studying the discourses that surround them, paying particular attention to the relationships between these new technologies and physical spaces. As Stuart Hall observes 'it is by our use of things, and what we say, think and feel about them – how we represent them – that we give them a meaning' (2013: xix). Furthermore, Terry Flew (2014) claims that there are often celebratory discourses surrounding new technologies that detail how they will enhance our daily lives. However, once that technology starts to become mainstream and familiar, then some of the initial optimistic expectations start to flounder. Certainly in recent years there has been a significant growth in the use of mobile media technology, especially smart phones. For instance, in the UK the OFCOM report *Adults Media Use and Attitudes* indicates that 'use of a mobile phone of any kind among

all adults' stands at 92%' (2014:19). Along with the growing use of smart phones the OFCOM report indicates that '...six in ten (61%) say they have between one and 20 apps installed on them' (2014:19). Similar findings are revealed in the Pew Center Research report *U.S. Smartphone Use in 2015*, which states that 64% of American adults now own a smartphone (Smith, 2015).

As a result of the growth of smart phone devices and applications the space between on-line and off-line is becoming blurred. Now public spaces with wireless connections enable us to engage in private mediated consumption (such as conversations, sending text messages and conducting Internet searches). Sherry Turkle (2008) points out that we have become intimately tethered to technological devices such as smart phones and tablets. In the early days of mobile technology, using a mobile phone in public places, or whilst with others was not socially acceptable but this is no longer the case. Sociologist Michael Bull (2005) coined the phrase 'no dead air' to refer to the ways in which mobile music devices enabled listeners to create their own cocoons of media consumption through customising their environments (through personalised playlists) and manage time (such as using listening to music to fill time during commuting). Bull's argument about mobile music devices could also be applied to smart phone applications. For instance, Larissa Hjorth and Ingrid Richardson (2009) discuss the ways in which location-based gaming can be used to offset the frustration or boredom of waiting for public transport, or standing in queues. Now that mobile devices such as music players and smart phones have become commonplace, transportation hubs such as train and bus terminals have become places where people communicate with others who are not co-present whilst ignoring those in the same physical space around them. On this point Sherry Turkle writes '...the presence of our tethering media signal that we do not want to be disturbed by conventional sociality with physically proximate individuals' (2008:122). Taking Turkle's argument into consideration the chapter will explore the ways in which location-based applications impact upon physical spaces and social interaction.

At present, within the field of media and communication studies, there is not a great deal of literature that focuses specifically upon smart phone and tablet applications. Gerard Goggin and Larissa Hjorth (2014) explore mobile media in relation to such issues and debates as political economy, ecology and creativity. Meanwhile, Jennie Germann Molz (2012) has studied the relationships between mobile devices, social networks and tourism. The work of Rich Ling and Jonathan Donner (2009) also provides an analysis of the mobile phone as a social, cultural and technological artefact. After considering some of the scholarship within contemporary media and communication studies, it appears that the investigation of location-based applications is under-developed. Therefore, this chapter is an attempt to contribute to the

study of technologically mediated encounters and stimulate further debate about location-based applications.

## Space/Place

To prepare the groundwork for the subsequent discussion it is useful to begin with some preliminary remarks about the conceptualisation of space and place. Phil Hubbard (2007) remarks that space is often considered an abstract concept whereas place refers to a specific location. Extending Hubbard's discussion, space can be studied at the macro level, whereas place can be studied at the micro level. At the macro socio-economic level, Henri Lefebvre (1991) illuminates the ways in which space can be a mechanism that supports the interests of the dominant power within society. Other writers, such as Manuel Castells (2000) and Zygmunt Bauman (2000) also provide insightful arguments about space in relation to technology, information and global capitalism. In contrast to macro studies of space, place can be examined at the micro level to elucidate specific communities of interest and the practices within them.

Cartography is a practice that relates to the construction of knowledge, power and legitimation. Ordnance Survey maps, for instance, transform physical space into information through the use of conventional symbols that represent roads, railways, mountains, hills, rivers, pathways and gradients. Once we learn what these conventional symbols represent, we can use an Ordnance Survey map to orientate ourselves as we move through space or to find a specific location. In his analysis of space, knowledge and power, Leighton Evans reminds us that 'cartographers are affected by the ideological and cultural influences placed upon them in their role in society, and maps as products and artefacts generate specific territorial knowledge' (2014: 74). From this perspective, cartography is linked to the ordering and management of spatial relations. Hakim Bey (1991), for example, critiques the ways in which cartography has been used for political purposes and what he terms 'psychic imperialism'. In an attempt to counter the control of places, Bey proposes the creation of Temporary Autonomous Zones which are transitory and emergent. As discussed, cartography has traditionally involved mapping physical space through the use of conventional symbols. However, to gain further insight into location-based applications we also need to consider how digital spaces have developed and the mechanisms by which they are mapped and controlled.

Location-based applications transform the spatial terrain into digital information that can be acquired and possessed. Historically, practices such as cartography created a formal abstraction of the physical world, through the use of conventional signs and symbols. However, digital technology transforms physical space through mathematical code into data. When spatial relationships are transformed into data they become malleable and can be manipulated and circulated to a greater degree than traditional ordnance survey paper-based maps. One of the distinctive features of location-based applications is that computer-generated and physical space is intertwined. As William J. Mitchell remarks ‘the social and cultural functions of built spaces have become inseparable from the simultaneous operation of multiple communication systems within and among them’ (2005:19). Going further, Mitchell claims that with the development of digital communication systems we are no longer constrained by time or physical space. Instead we have become ‘homo electronicus’ a term which refers to ‘endless shifts of attention and engagement throughout the reaches of space and time’ (Mitchell, 2005: 185). Drawing upon the arguments presented by Tutt and Mitchell, this chapter highlights technologically mediated experiences by focusing on the location-based application Foursquare.

## Foursquare

Foursquare is a socially and culturally significant location-based application since according to the company’s web-site (<https://foursquare.com>) in 2015 it has 50 million registered users. Foursquare was created by Internet entrepreneurs Dennis Crowley and Naveen Selvadurai and launched in 2009. Crowley studied Interactive Telecommunications at New York University (NYU) and one of his tutors was media and communication scholar Clay Shirky. During an interview with Tim Adams in the British newspaper *The Observer*, Shirky discusses the Interactive Telecommunications curriculum in relation to the development of Foursquare. In particular, Shirky states that students considered the ways in which ‘the grid of Manhattan was like a grid in a game scenario’ (Shirky in Adams 2010). Indeed, the name Foursquare evokes the grid plan of New York City where there are blocks with numerical names such as First, Second and Fifth Avenue. The rectangular grid of Manhattan, which was outlined in the Commissioners Plan of 1811, involved of shaping urban space into grid-like, standardised units (Lindner, 2015). Moreover, this geometrical aesthetic can be placed in the wider context of the architectural style of Modernism. The geometry of the Modernist aesthetic emerged during the industrial era when it became possible to mass produce standardised objects. As Stanislaw Van

Moos (1979) points out Modernist architects such as Ludwig Mies Van de Rohe (1886-1969) and Le Corbusier (1887-1965) presented new forms of urban spaces based on grid like, standardised structures with buildings made from concrete, glass and steel. However, in the case of location-based applications, instead of producing grids from physical materials, global positioning technology can be used to construct information grids from base stations that divide space into defined segments.

Michel de Certeau (1988) also provides commentary on the ways in which toponymy (the naming of city spaces) maps our spatial experiences within specific historical, social and cultural contexts. For example, the East End or West End of London, uptown/downtown, Harlem or the East Village in New York are associated with different inhabitants, buildings, sounds, symbols and lifestyles. Place names may also recall historical figures, such as Avenue Victor Hugo in Paris or a place may be named as an act of remembrance as a way of recalling certain events such as Trafalgar Square in London. In contrast to the practice of toponymy, Foursquare maps spatial relationships according to informational content based on lifestyle categorises such as: arts, best nearby, food, nightlife and trending. In this way Foursquare is reminiscent of guide books or magazine publications such as *Time Out* or the *Lonely Planet* series which provide information about leisure and sites of consumption rather than Ordnance survey maps.

Locations on Foursquare are allocated a numerical rating which is based on data mining of likes, dislikes, positive or negative comments from those who use the application. The practice of allocating ratings to locations has increased in recent years through on-line platforms such as Google Reviews and Trip Advisor. Weiguo Fan and Michael D Gordon (2014) outline a range of practices that are now used to influence consumer behaviour through brand engagement or information about particular locations. These practices include: social media analytics, sentiment and trend analysis, polarity lexicons and opinion mining. Fan and Gordon explain that what these practices have in common is that they extract data from on-line sources and analyse them for marketing purposes.

In contemporary culture there is a mass of information but our attention span is limited. We may attempt to deal with this situation by seeking out information that matches our interest and is relevant to us. Yet we may then miss out on information such as unexpected ideas, people or places that are outside of our existing range of tastes and interests. The work of Robert B Cialdini (2007) indicates that we are influenced according to what is popular, a process he terms social proof. Therefore if a place appears to be popular on a location-based application this may influence others to visit it. Additionally Cialdini states that 'the principle of social proof

operates most powerfully when we are observing the behaviour of people just like us' (2007:140). Internet activist Eli Pariser (2011) contends that what has tended to happen with the growth of social networks is that people connect with those they already know and who have similar interests and opinions. Consequently the behaviour of those who use location-based applications could be influenced according to what their friends like, or the places their friends or peers visit. Richard H Thaler and Legal Scholar Cass R. Sunstein (2008) have also investigated the ways in which people can be nudged into changing their behaviour through choice architecture. In other words, the choices that are made available to people and how those choices are presented can influence their behaviour. Therefore the sites that are listed as the most popular on location based applications may nudge people into visiting them. Yet we also need to think critically about how places are included or excluded in the choice architecture of location-based applications. For instance, the choice architecture of location-based applications could be influenced by organisations that are willing to pay for places that support their economic interests to have prominence over others.

## Play

In the 1960s developments in computing and computer graphics led to the creation of a new form of space and spatial relationships (Woolley 1993). The North American writer, William Gibson encapsulated the concept of this new form of space through his use of the term cyberspace in his novel *Neuromancer* (1986). In Gibson's novel cyberspace refers to an abstract environment which is generated by computer code. This new form of computer-generated space provided the platform for the development of virtual environments and computer games. During the late 1970s and 1980s computer games were played in amusement arcades, shopping centres or bars. Then from the mid-1980s onwards gaming consoles and personal computers opened up the possibility of using computer games within the domestic sphere. Notably during this period there was an emphasis on the boundaries between the virtual space of the game and real world environments. During the mid-1990s there were a range of critical studies about cyberspace and virtual environments (Carter 1995; Franck 2002 and Turkle 1994, 1997). However, in agreement with Dylan Tutt (2008) these studies of cyberspace and virtual reality were often framed according to disembodiment and disconnection from the world around us. Yet the development

and popularity of location-based applications has produced a situation whereby 'mediated interaction cannot simply be disembedded from everyday life' (Tutt 2008:1158).

Instead of having a clear demarcation between the space of a game and the physical environment, location-based applications incorporate features of our physical environment into a gaming experience. Game scholar Ingrid Richardson (2010) indicates that the blurring of the boundaries between the virtual and the real in the context of mobile gaming also has implications for the concept of the magic circle or dedicated game world. For what is noteworthy about location-based applications is that the urban environment becomes the site of game-playing experiences. To take a case in point consider the location-based application *Ingress* (2012) created by Niantic Labs is an augmented reality game that blends real world locations with game playing activities. The game is based on the premise that a global event has occurred whereby the Earth has been seeded with a new form of exotic matter by an alien race. Players are divided into two factions, the Enlightened Faction who believe that this global event will catapult mankind to a higher state of consciousness and the Resistance who are dubious about the impact of exotic matter upon mankind. What *Ingress* does is transform the physical environment such as monuments, public buildings, public spaces and transport hubs into portals that can be fought over and acquired by factions. In this way the physical infrastructure of the world becomes part of the game-playing experience.

The incorporation of the ludic qualities of gaming into everyday experience is also evident in the application *Zombies Run!* which was created by Naomi Alderman and Rebecca Levene of the company Six to Start. *Zombies Run!* provides a technologically mediated approach to running, in which exercise is framed as an epic adventure through story-telling, characterisation and music. Players of the game are given missions which form the basis of running logs and status reports that can be shared with others via social networking. Through linking to social networking sites, location based applications such as *Zombies Run!* facilitate friendships and a sense of competition amongst different users. Another location-based application which combines ludic and social elements, is *Sacracy* which consists of quests and treasure hunts. *Sacracy* combines medieval iconography and game-world quests with real world environments. Through the use of GPS technology, *Sacracy* players can move through physical space and also move a virtual character through the game to solve puzzles. Finally, *Tourality* is a location-based application in which players attempt to compete with others to get to a particular location in the shortest time possible.

Location-based game applications provide a series of enticements such as points, badges and levelling up. For instance, *Sacracy* features an achievement screen which lists those



players with the highest scores. Players can increase their scores by improving their skills in using weapons and moving up to different levels. In the case of *Tourality* users compete for virtual gold and trophies that are acquired by reaching specific locations. The game playing features of location-based application also involve performing for an imagined audience. For instance, some players may feel compelled to manage their on-line status through in game chat with other players and maintaining their profile so that it displays their latest achievements. As game designer Jane McGonigal (2012) points out players of location-based games are able to generate a sense of achievement by overcoming obstacles and improving their skills. In the context of our working lives we may be working towards goals that are corporate driven rather than our own. In contrast, location-based games can enable the player to exercise some agency within the structural limitations of the programming and software.

## Privacy

The modes of surveillance that are made possible by location-based applications are historically, socially and culturally specific. As Fiona Jeffries rightly observes surveillance and security have intensified in the post 9/11 era generating a 'culture of suspicion' in which people can become vulnerable to state and corporate surveillance (2011:175). The movements of those who use location-based applications can be tracked, observed and shared with others through global positioning systems and social networks. Movement through physical space can be curtailed through visible boundaries such as walls, gates and sentry points that maintain privacy by preventing others from observing or interacting with us. In the case of computer-based technology, however, it is possible to construct what Marc Andrejevic (2007) terms digital enclosures such as information grids and geo-fences that raise concerns in relation to privacy, data mining and surveillance. Andrejevic explains that digital enclosure is a concept which refers to the trails that are left as we use the Internet to send emails, conduct Google searches or on-line shopping. In agreement with Andrejevic smart phones can be continually tracked using satellite global positing systems. Orbiting the Earth these satellites triangulate the position of the user to a set of spatial co-ordinates that are held in a database. Although smart phones and location-based applications seem to offer us many benefits, what is less visible is how they can be used to mine personal data. As Andrejevic warns 'using a cell phone or credit card these days is deceptively simple: communicating and purchasing are streamlined and simplified, but we

have very little access to the forms of information collection and circulation that are taking place behind the scenes and screens' (2007:4).

The application *Life 360* which was founded by Chris Hulls and Alex Haro simultaneously tracks and connects a range of family members. By April 2015, *Life 360* claims that 50 million families are using the application to map the location of family members and friends ([www.life360.com](http://www.life360.com)). The developers of *Life 360* promote the application as a way of solving problems based on different family members having different schedules and activities that are based across multiple locations. *Life 360* also draws upon parents' desire to keep their children safe, by knowing where they are, who they are with and what they are doing. Those who use *Life 360* can set up automatic notifications for places they frequent the most and share this information within their family circle. These features of *Life 360* indicate that surveillance is positioned as something that people will willingly accept because it satisfies their need to feel safe.

Although it is free of charge to open an account with companies such as *Foursquare* and *Life 360*, their business model is predicated upon collecting data from their users and using this for commercial gain. The use of personal data by these companies and third party affiliates is set out in their terms and conditions. Yet these terms and conditions are written in complicated legal language which impedes comprehension. Moreover, *Foursquare* and *Life 360* are in a powerful position because users can only set up an account with these companies by accepting the terms and conditions in their entirety. Users are enticed to accept the terms and conditions that are offered to them because they want to use these applications and the services they provide to find information and communicate with family, friends and colleagues.

To set up an account with *Foursquare* or *Life 360* the user must provide sensitive personal data such as their name, e-mail address and date of birth. After the user's personal data is collected an individual profile is created which enables them to upload user-generated content such as photographic images, text and connect with other users. In the case of *Foursquare* users can create a basic profile which displays their photographic image, social connections and a history of the reviews they have created about the locations they have visited. Meanwhile users of *Life 360* are encouraged to provide data about their social connections in order to create particular groupings, called circles which include caregivers and extended family members.

Whilst users may find it easy to open an account with *Foursquare* or *Life 360*; it is difficult to ascertain how their data will be handled. When a person is placed under surveillance their activities are monitored but they are not aware of who is watching them, or for what purposes.

Christian Fuchs (2011) examines the term surveillance and points out that it stems from the French term *surveiller* which means to oversee or watch over, which has implications in terms of hierarchical forms of power. From this perspective it can be contended that *Foursquare* or *Life 360* are in a position of power because they can oversee or watch over the data that is provided by users. In contrast, those users are powerless in terms of determining exactly how those companies collect and share their data. For instance, *Foursquare* (<https://foursquare.com/legal/privacy>) states that:

We may work with advertisers or other partners and advertising service providers to serve ads or services that may be relevant to you based on your inferred interests or location (or both) to computers, mobile phones or other devices, which may use a device ID, cookie, pixel or other similar technology placed by Foursquare or the third party.

Yet there is no detailed information about the third party affiliations that exist between *Foursquare* and other companies, or how they will use the data that they obtain. *Foursquare* also uses cookies which are small pieces of data that are sent from their web-site and stored on a user's browser whilst they visit that site. One of the functions of cookies is to compile the browsing history of user's. Of note is that *Foursquare* compiles data on the locations a user has visited, plus the locations their friends have visited in order to provide information to them about special offers and recommended places (bars, restaurants and other retail outlets).

The content that is provided by users of applications can also be used for commercial purposes. For instance, the *Life 360* application ([https://www.life360.com/terms\\_of\\_use/](https://www.life360.com/terms_of_use/)) web-site states that by posting content a user gives the organisation:

A royalty-free, sublicensable, transferable, perpetual, irrevocable, non-exclusive, worldwide license to use, reproduce, modify, publish, list information regarding, edit, translate, distribute, syndicate, publicly perform, publicly display, and make derivative works of all such User Content.

In his critical assessment of the Internet and social networks Andrew Keen (2015) discusses the Stasi (The East German Secret Police) and their mission to collect information about every member of East German society in comparison to current concerns regarding on-line privacy and surveillance. Keen the Stasi surveillance system was based on a network of informants who scrutinized the daily lives of citizens. However he claims that the project to amass information on all East German citizens now seems parochial since companies such as Google and Facebook operate globally. Furthermore, now citizens disclose personal data themselves via their use of social networking sites.

Michel de Certeau's study of subverting institutionalised forms of power is useful in terms of understanding the privacy and surveillance implications surrounding location-based applications. To explain how subversive tactics operates de Certeau makes analogies between the linguistic system as a whole and the creativity of individual speech. de Certeau contends that although individual speakers are required to draw upon the conventions of language to make meaningful utterances there is also a sense in which they can exercise a degree of agency through improvised speech acts. From this vantage point, language use and the practices surrounding the exploration of the urban environment can be considered as symbolic systems of signification that generate meaning in specific historical, social and cultural contexts. Elucidating this position, de Certeau writes: 'The act of walking is to the urban system what the speech act is to language or the statements uttered' (1988:97). Drawing analogies from language, de Certeau defines walking as 'a space of enunciation in which walking becomes a personal statement, or form of expression' (1988: 98). There is a subjective element to our walking practices as we drift through the city, or take detours to explore new places. de Certeau considers those aspects of our movements through the city which cannot be fully mapped, measured and monitored. For instance, when talking about our footsteps de Certeau states that 'they cannot be counted because each unit has a qualitative character: a style of tactile apprehension and kinaesthetic appropriation' (1988: 97). For example, the ways in which we walk or our gait has a subjective qualitative aspect that eludes systems of measurement and quantification. de Certeau illustrates the ways in which we can draw upon a shared conventional system but still utilise this system in a creative way. Taking de Certeau's arguments about creativity, subjectivity and agency into account it is worthwhile considering the terminology that surrounds location-based applications, for instance, are people who engage with these applications positioned as users, players or consumers or a combination of all three? In addition, how much agency or creativity can be exercised when engaging with these applications?

In his study of everyday life, de Certeau concentrates on two key practices which he terms strategies and tactics. The term strategies refers to the dominance of space through institutionalised forms of ownership such as the privatization of places or controlled movement through those places. As discussed earlier, the integration of Global Positioning Systems into smart phone devices creates electronic tagging devices that can track our movements as they take place. Data can also be collected on mobile communication and our location through Base Transceiver Stations (BTS) and call detail records (CDR) which give details of the location of a caller and the duration of their call (Poole, 2006). In de Certeau's schema tactics are the unofficial, marginal and improvisational practices that can be used to subvert dominant ideological strategies and practices. Another useful way of thinking about tactics is provided by

Gary T. Marx (2002) who outlines a series of practices which can be used to subvert surveillance mechanisms. For instance, masking moves could be used to create false accounts or profiles when using location-based applications.

Gary T. Marx also asserts that in some cases we may be compliant with surveillance systems, for instance, providing information to authorities or companies because this is regarded as advantageous or necessary. For instance we may offset the disadvantages of providing personal data when acquiring location-based gaming applications if they also provide access to commercial discounts in stores or other forms of reward. The data that is generated by location-based gaming applications could also be acquired and utilised by Governments, law-enforcement agencies or used for commercial interests. For instance, computer science researchers at Cambridge University obtained datasets from *Foursquare* users via publicly available information on Twitter. These datasets were then analysed to investigate levels of activity in different cities (Noulas et al 2012). Furthermore, in an article in the *New Scientist*, journalist Chris Baraniuk (2013) details the ways in which *Foursquare* datasets are used by companies such as McDonalds, Starbucks and Dunkin Donuts about where to open new outlets because these datasets track levels of mobility in particular parts of a city.

## Conclusion

This chapter has outlined the ways in which the mapping of physical space relates to issues of power and control. There was a consideration of the ways in which maps become legible and involve a certain degree of literacy, since we learn to recognise a conventional set of symbols. Moving on, there was an exploration of how location-based applications map and control space mathematically through computer code. Location-based applications such as *Foursquare* were shown to map places according to lifestyle rather than topographical qualities. Additionally, there was an investigation of the ways in which location-based applications use metrics to evaluate places according to popularity. Through capturing and displaying information about places it is possible that location-based applications such as *Foursquare* could nudge people to visit those places that are the most popular or frequently visited and other parts of the urban environment could become unexplored backwaters.

The chapter also indicated that location-based applications can be used to transform the urban environment into a game environment. Whilst location-based applications such as *Ingress*, *Zombies Run!*, *Sacracity* or *Tourality* may be promoted as offering enjoyable ludic

experiences; they are also a mechanism of surveillance and data mining. In some cases users of location-based applications may openly disclose personal data as they communicate with others via social networks. However, the data which is captured from these location-based applications may also be sold by developers to other commercial interests for marketing and advertising purposes. Crucially, then the ludic discourses surrounding these applications can be regarded critically as a mechanism that supports institutional power. In addition, the ways in location-based applications are mechanisms for data mining remains somewhat opaque to those who use them.

The surveillance and privacy implications of personal data in relation to location-based applications are part of a broader set of concerns about the impact of technological developments. For as devices become increasingly networked and incorporated into everyday life it will be possible to continually trace the movements, behavioural practices and social networks of individuals in even greater detail. For instance, the term The Internet of Things (Burrus, 2014) refers to the ways in which the physical infrastructure of the urban environment will be replete with information that will capture data from street lights, traffic signals, close circuit television and smart objects. Here we could imagine a scenario whereby a user leaves digital footprints through the use of their smart phone, location-based applications, the myriad objects they use in daily life and the urban environment. The introduction of such comprehensive forms of communication and information gathering is likely to generate further debate from individuals, consumer and advocacy groups as well as legal and government institutions. In May 2014, The European Court of Justice ruled that an individual has the right to request that on-line information about them be removed if this is irrelevant, outdated or excessive. This ruling is known as 'the right to be forgotten' and is already reverberating in terms of requests made to Google and Facebook. Therefore it is possible that in the future individuals may request that information that appears on their location-based services, such as the bars or restaurants that they frequented years ago be removed because it is no longer relevant. Of course some may object that the recording information about where they had a coffee or lunch using location-based applications is not sensitive personal data and is insignificant in terms of privacy and surveillance. However, it can be maintained that these micro moments of our everyday lives do become increasingly significant when they are tracked continually, forming a perpetual web of technological surveillance. Taking these points into consideration this chapter concludes that the practical informational function and ludic qualities of location-based applications are significantly offset by their surveillance dimensions.

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